

INSTRUCTION MANUAL FOR WIRE WELDING MACHINE

IMPORTANT: BEFORE STARTING THE EQUIPMENT, READ THE CONTENTS OF THIS MANUAL, WHICH MUST BE STORED IN A PLACE FAMILIAR TO ALL USERS FOR THE ENTIRE OPERATIVE LIFE-SPAN OF THE MACHINE. THIS EQUIPMENT MUST BE USED SOLELY FOR WELDING OPERATIONS.

1 SAFETY PRECAUTIONS

WELDING AND ARC CUTTING CAN BE HARMFUL TO YOURSELF AND OTHERS. The user must therefore be educated against the hazards, summarized below, deriving from welding operations. For more detailed information, order the manual code 3.300.758

ELECTRIC SHOCK - May be fatal.



- Install and earth the welding machine according to the applicable regulations.
- Do not touch live electrical parts or electrodes with bare skin, gloves or wet clothing.
- Isolate yourselves from both the earth and the workpiece.
- Make sure your working position is safe.

FUMES AND GASES - May be hazardous to your health.



- Keep your head away from fumes.
- Work in the presence of adequate ventilation, and use ventilators around the arc to prevent gases from forming in the work area.

ARC RAYS - May injure the eyes and burn the skin.



- Protect your eyes with welding masks fitted with filtered lenses, and protect your body with appropriate safety garments.
- Protect others by installing adequate shields or curtains.

RISK OF FIRE AND BURNS



- Sparks (sprays) may cause fires and burn the skin; you should therefore make sure there are no flammable materials in the area, and wear appropriate protective garments.

NOISE



This machine does not directly produce noise exceeding 80dB. The plasma cutting/welding procedure may produce noise levels beyond said limit; users must therefore implement all precautions required by law.

PACEMAKERS

- The magnetic fields created by high currents may affect the operation of pacemakers. Wearers of vital electronic equipment (pacemakers) should consult their physician before beginning any arc welding, cutting, gouging or spot welding operations.

EXPLOSIONS



- Do not weld in the vicinity of containers under pressure, or in the presence of explosive dust, gases or fumes.
- All cylinders and pressure regulators used in welding operations should be handled with care.

ELECTROMAGNETIC COMPATIBILITY

This machine is manufactured in compliance with the

instructions contained in the harmonized standard EN50199, and must be used solely for professional purposes in an industrial environment. There may be potential difficulties in ensuring electromagnetic compatibility in non-industrial environments.

IN CASE OF MALFUNCTIONS, REQUEST ASSISTANCE FROM QUALIFIED PERSONNEL.

2 GENERAL DESCRIPTION

This power source must be used exclusively for welding, and must be located in a suitably ventilated and preferably non-dusty environment, being careful not to block the flow of air through the cooling fins.

The weight of this welding machine is 22.5 kg.

2.1 SPECIFICATIONS

This manual has been prepared for the purpose of educating personnel assigned to install, operate and service the welding machine.

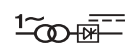
This equipment is a constant-voltage power source, suitable for MIG/MAG and OPEN-ARC welding.

Upon receiving the machine, make sure there are no broken or damaged parts.

The purchaser should address any complaints for losses or damage to the vector. Please indicate the article and serial number whenever requesting information about the welding machine.

2.2 EXPLANATION OF TECHNICAL SPECIFICATIONS

EN 50199 The welding machine is manufactured according to these international standards.
EN60974.1 serial number, which must always be indicated on any type of request regarding the welding machine.
N°



Single-phase transformer-rectifier.



Flat characteristic.
MIG/MAG. Suitable for continuous electrode welding.
I2 max. Unconventional welding current.

The values represent the minimum and maximum levels attainable in welding.

U0. Secondary open-circuit voltage.

X. Duty cycle percentage.

The duty cycle expresses the percentage of 10 minutes during which the welding machine may run at a certain current with-overheating.

I2. Welding current

U2. Secondary voltage with welding current I2.

U1. Rated supply voltage

3~ 50/60Hz 50- or 60-Hz three-phase power supply.

I1 Max Max. absorbed current at the corresponding current I2 and voltage U2.

I1 eff This is the maximum value of the actual current absorbed, considering the duty cycle.

This value usually corresponds to the capacity of the fuse (delayed type) to be used as a protection for the equipment.

IP21 Protection rating for the housing.

Grade 1 as the second digit means that this equipment is suitable for use outdoors in the rain.

S Suitable for use in high-risk environments.

NOTES: The welding machine has also been designed for use in environments with a pollution rating of 3. (See IEC 664).

2.3 OVERLOAD CUT-OUT

This machine is protected by a thermostat, which prevents the machine from operating if the allowable temperatures are exceeded. In these conditions the fan continues to operate and the lamp D lights.

3 INSTALLATION

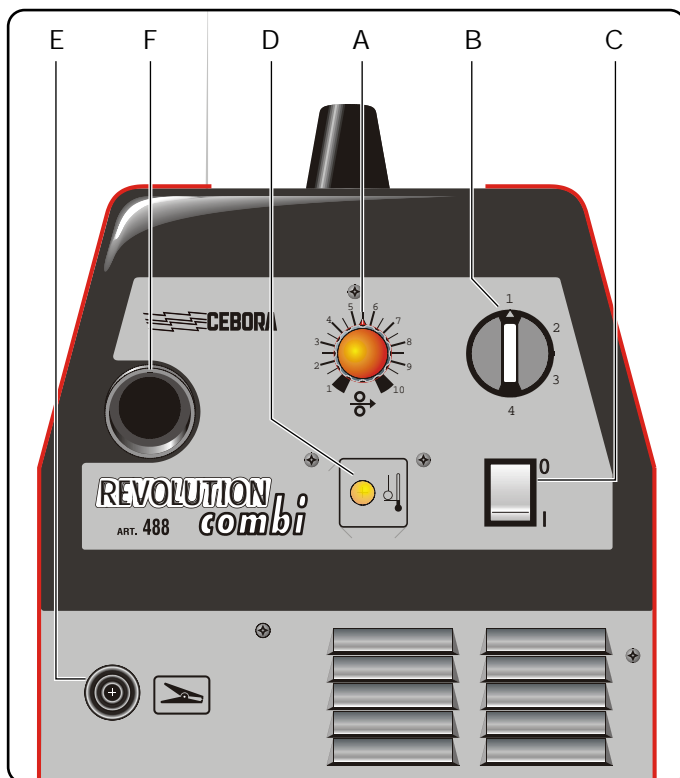
The machine must be installed by skilled personnel. All connections must be carried out in compliance with and in full observance of current safety laws.

Make sure that the supply voltage matches the voltage indicated on the specifications plate of the welding machine.

If it is not already mounted, mount a plug with an adequate capacity on the supply cable, making sure that the yellow/green conductor is connected to the earth pin.

The capacity of the overload cutout switch or fuses installed in series with the power supply must be equivalent to the absorbed current I1 of the machine.

3.1 CONTROLS ON THE FRONT PANEL.



- A) **Setting knob.**
Adjusts the welding wire speed.
- B) **Selector switch.**
Adjusts the welding voltage.
- C) **Switch.**
Turns the welding machine on and off.

D) **Yellow lamp.**

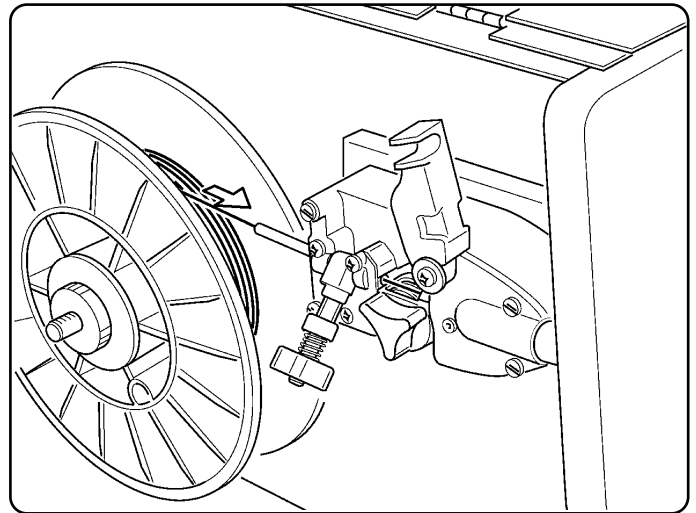
Lights only when the thermostat stops welding machine operation.

E) **Earth cable.**

F) **Welding torch.**

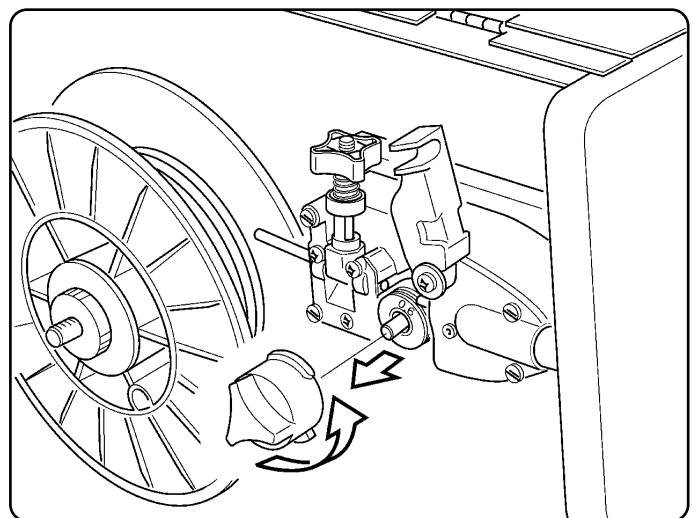
4 START-UP AND WELDING STEEL WITH FLUX-CORED WIRE WITHOUT GAS PROTECTION.

Open the coil compartment and remove the wire from inside the torch, used for the final machine inspection. Remove the casing protecting the wire.



Remove the wire from the coil hole and cut as much as needed for the end to be straight, insert the wire into the plastic tube of the gearmotor, passing it over the wire feeder roller and inserting it in the torch sheath for at least 30 cm. Make sure that the wire feeder roller groove is compatible with the wire used. **The Ø 0.9-mm flux-cored wire must be drawn using the knurled groove marked 0.8.**

To replace the wire feeder roller, proceed as shown in the figure.



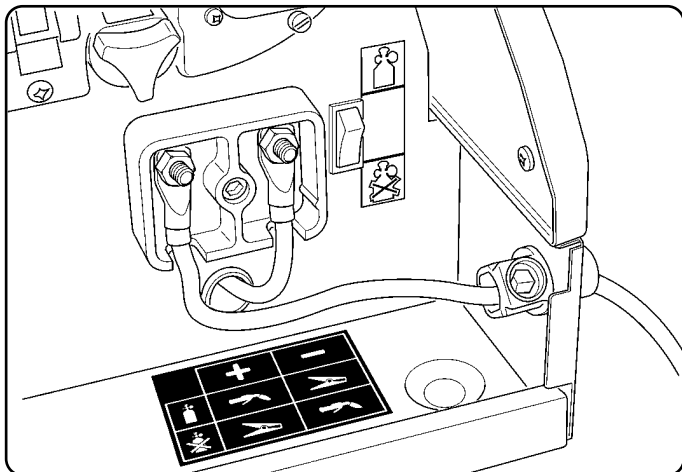
Lower the roller press arm, making sure that the wire remains inside the roller groove.

After connecting the mains cable to a suitable power socket, turn on the welding machine using the switch 32. Remove the gas nozzle 39 by turning it clockwise, unscrew the contact tip 40 from the welding torch 27.



Set the selector switch 37, located inside the coil compartment, to NO GAS.

Make sure that the earth cable 26 and the power cable of the torch 27 are correctly inserted on the terminal board 29, so that they observe the correct polarity (see figure). Press the torch trigger until the wire comes out the end.



Be very careful never to aim the torch at parts of the body or other people while wire is coming out of the torch.

Screw the contact tip 40 back on, making sure that the hole diameter is equal to that of the wire used. Insert the gas nozzle 39, again turning it clockwise.

Use the selector switch 35 to select the welding voltage according to the thickness to be welded: position 1 will weld thicknesses of approximately 1mm, while position 4 is for 4/5mm. Connect the earth cable 26 to the workpiece.

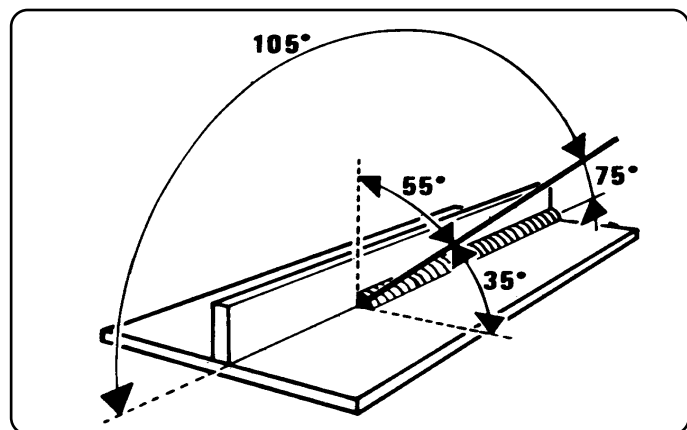
Move the torch close to the welding point, position the safety mask over your eyes, light the welding arc by pressing the torch trigger 27.

In order to have a stable arc you must keep the gas nozzle as close as possible to the workpiece and adjust the proper wire speed wire using the knob 2, so that the noise of the arc is continuous, even and constant.

If the speed is too high the wire tends to stick to the piece, while vice-versa, if the speed too low the wire melts into occasional droplets and the arc tends to shut off often.

At the end of each welding session, remove all waste using the hammer/brush provided.

For proper welding, adopt the position shown in the figure. Welding with the Ø 0.9mm flux-cored wire does not require gas protection and is therefore suitable for out-



door welding.

4.1 WELDING STEEL WITH SOLID WIRE AND GAS PROTECTION.

To weld steel, you may use blends of inert gases containing Argon and percentages of Co2 ranging from 25% to 18%, or pure Co2. Using Co2 alone will produce metal splatters while welding, and is therefore not recommended for jobs where appearances are important.

The gas cylinder must be equipped with a pressure regulator and flow gauge.

If the cylinder is located on the cylinder shelf of the wire feeder art. 1432, it must be fastened using the chain provided. Connect the gas hose leaving the rear of the machine to the pressure regular, only after positioning the cylinder.

The gas flow must be adjusted to approximately 8-10 liters/minute.

See paragraph 4 for instructions on mounting the wire inside the torch and the welding technique to be used.

This power source uses wires Ø 0.6mm and Ø 0.8mm.

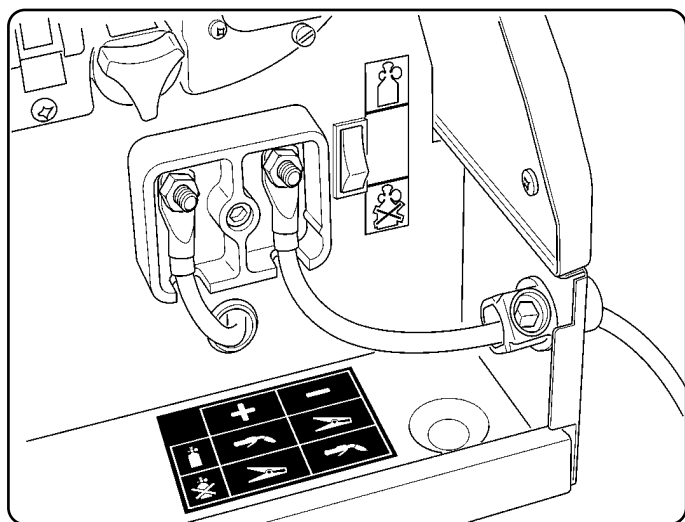
You may weld thicknesses ranging from a minimum of 0.6mm to a maximum of 4/5mm.



Set the selector switch 37, located inside the coil compartment, to GAS.

Make sure that the earth cable 26 and the torch 27 are correctly inserted on the terminal board 29, so that they observe the correct polarity (see figure).

Welding carried out using gas does not produce waste, and may not be carried out in drafty environments.



4.2 WELDING STAINLESS STEEL

The welding machine must be set up as for welding steel with gas protection, applying the following variations:

- Coil of stainless steel wire with a composition suited to the base material to be welded.
- Argon gas and a percentage of O2 2% (recommended composition).

This power source uses a wire Ø 0.6mm.

It is possible to weld thicknesses ranging from a minimum of 1 mm to a maximum of 3 mm.

4.3 WELDING ALUMINUM

The welding machine must be set up as for welding steel with gas protection, applying the following variations:

- Argon gas.
- Coil of aluminum wire with a composition suited to the base material to be welded.

For welding aluminum it is important that the base material be cleaned with tools that have only been used on aluminum.

This power source uses a wire Ø 0.8mm.

It is possible to weld thicknesses ranging from a minimum of 1 mm to a maximum of 3 mm.

5 WELDING DEFECTS

1- DEFECT-CAUSES	Porosity (within or outside the bead) <ul style="list-style-type: none">• Electrode defective (rusted surface)• Missing safety gas due to:<ul style="list-style-type: none">- low gas flow- flow gauge defective- regulator frosted due to no preheating of the CO2 protection gas- defective solenoid valve- contact tip clogged with sprays- gas outlet holes clogged- air drafts in welding area.
2- DEFECT-CAUSES	Shrinkage cracks <ul style="list-style-type: none">• Wire or workpiece dirty or rusted.• Bead too small.• Bead too concave.• Bead too deeply penetrated.
3- DEFECT-CAUSES	Side cuts <ul style="list-style-type: none">• Welding pass done too quickly• Low current and high arc voltages.
4- DEFECT-CAUSES	Excessive spraying <ul style="list-style-type: none">• Voltage too high.• Insufficient inductance.• No preheating of the CO2 protection gas

6 MAINTAINING THE SYSTEM

Safety gas nozzle . This nozzle must be periodically cleaned to remove sprayed metal. Replace if distorted or squashed.

Contact tip. Only a good contact between this contact tip and the wire can ensure a stable arc and optimum current output; you must therefore observe the following precautions:

A) The contact tip hole must be kept free of grime and oxidation (rust).

B) Sprayed metal sticks more easily after long welding sessions, blocking the wire flow. The tip must therefore be cleaned more often, and replaced if necessary.

C) The contact tip must always be firmly screwed onto the torch body. The thermal cycles to which the torch is subjected can cause it to loosen, thus heating the torch body and tip and causing the wire to advance unevenly.

Wire liner. This is an important part that must be checked often, because the wire may deposit copper dust or tiny shavings. Clean it periodically along with the gas lines,

using dry compressed air.

The liners are subjected to constant wear and tear, and therefore must be replaced after a certain amount of time. **Gearmotor group**. Periodically clean the set of feeder rollers, to remove any rust or metal residue left by the coils. You must periodically check the entire wire feeder group: hasp, wire guide rollers, liner and contact tip.

7 ERRORS DURING USE

NOTE: All tasks should be carried out only by skilled personnel.

Disconnect the power supply cable from the mains before working on the cables or opening the machine.

The machine is equipped with a safety thermostat that trips in case of overload. You must wait a few minutes after this intervention to allow the source to cool.

The table below lists the most common errors, causes and solutions.

8 ACCESSORIES

Art. 1432 Power source trolley.

Art. 1450 Flow meter with 2 pressure gauges.

Art. 1475 Coil of copper-coated Fe wire Ø 0.6/5 kg .

Art. 1477 Coil of copper-coated Fe wire Ø 0.8/5 kg .

Art. 1580 Coil of copper-coated Fe wire Ø 0.6/0.8 kg.

Art. 1581 Coil of copper-coated Fe wire Ø 0.8/0.8 kg.

Art. 1582 Coil of Aluminium wire Ø 0.8/0.2 kg.

Art. 1583 Coil of Stainless steel wire Ø 0.6/0.5 kg.

Art. 1586 Coil of Flux-cored wire Ø 0.9/0.9 kg.

Art. 1587 Coil of Flux-cored wire Ø 0.9/4.5 kg.

Art. 1457 Contact tip Ø 0.6.

Art. 1459 Contact tip Ø 0.8.

Art. 1462 Contact tip Ø 0.9 flux-cored wire.

Art. 1461 Welding gas nozzle.

Art. 1463 Spot-welding gas nozzle.